

Use of GM Plants in Brazil and in South America/Global Market

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Ministry of Agriculture, Livestock and
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Possibilities for Agriculture

- ✓ **Increased productivity**
- ✓ **Reduced use of agrochemicals**
- ✓ **Reduction of production costs**
- ✓ **Improved quality and health**
- ✓ **Increased nutritional food**
- ✓ **Production of specific substances**
- ✓ **Use of marginal lands**

Possible Paths in Brazil

Path 1

Technology ban or moratorium until all the controversial aspects related to GMOs are totally pacified worldwide

Path 2

Risk Assessment of GMOs

Regulation and monitoring activities with identified risk

Talk with society about the applications and benefits of technology

Research investments in areas of genetic engineering, biodiversity, coexistence, germplasm preservation, etc

Law nº 11.105, dated March 24th, 2005

“Brazilian Biosafety Law”

Provides for safety norms and inspection mechanisms for activities with GMOs and their by-products

Policy for Biotechnology Development

Decree No. 6.041/2007

Objective: *the establishment of appropriate environment for the development of innovative biotechnology products and processes*

Policy for Biotechnology Development

Decree No. 6.041/2007

Creates the National Biotechnology Committee

Key points for action:

I – Investments

II – Human Resources

III – Infrastructure

IV – Regulatory frameworks

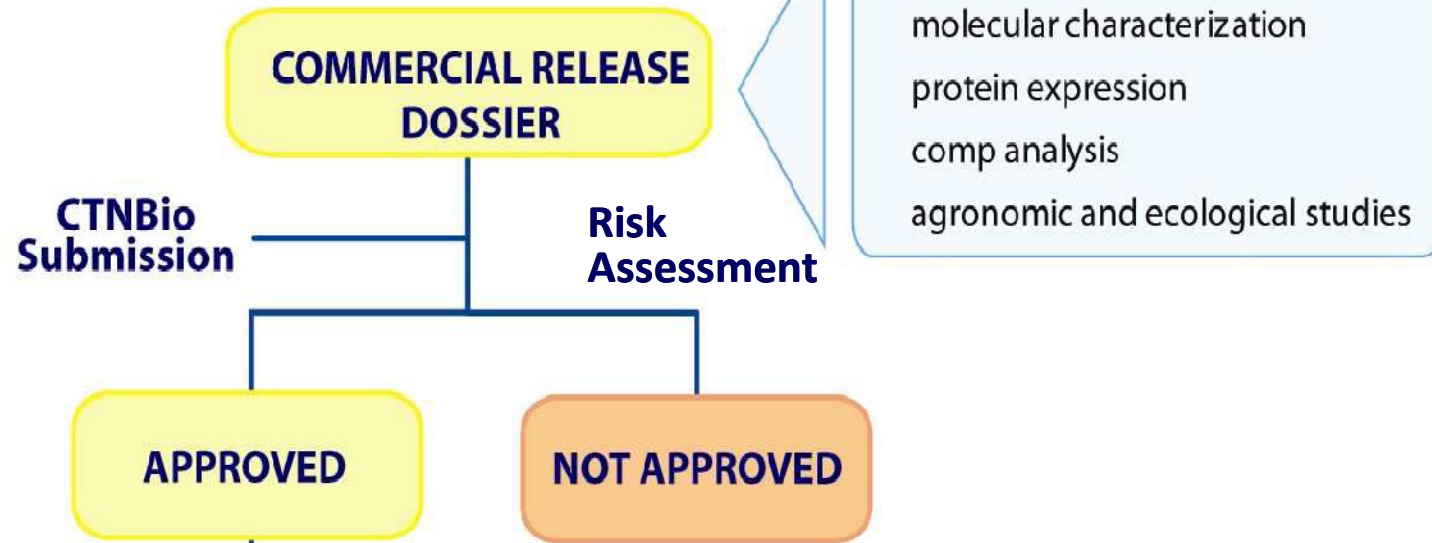
❖ Not limited to GMOs (includes cloning, nano, genomics, etc)

Approach to Safety Evaluation of GM Crops

- **Sound Science Base**
- **Harmonization with CODEX
guideline and Cartagena Protocol
(annex III)**
- **Case-by-case**
- **Multidisciplinary**

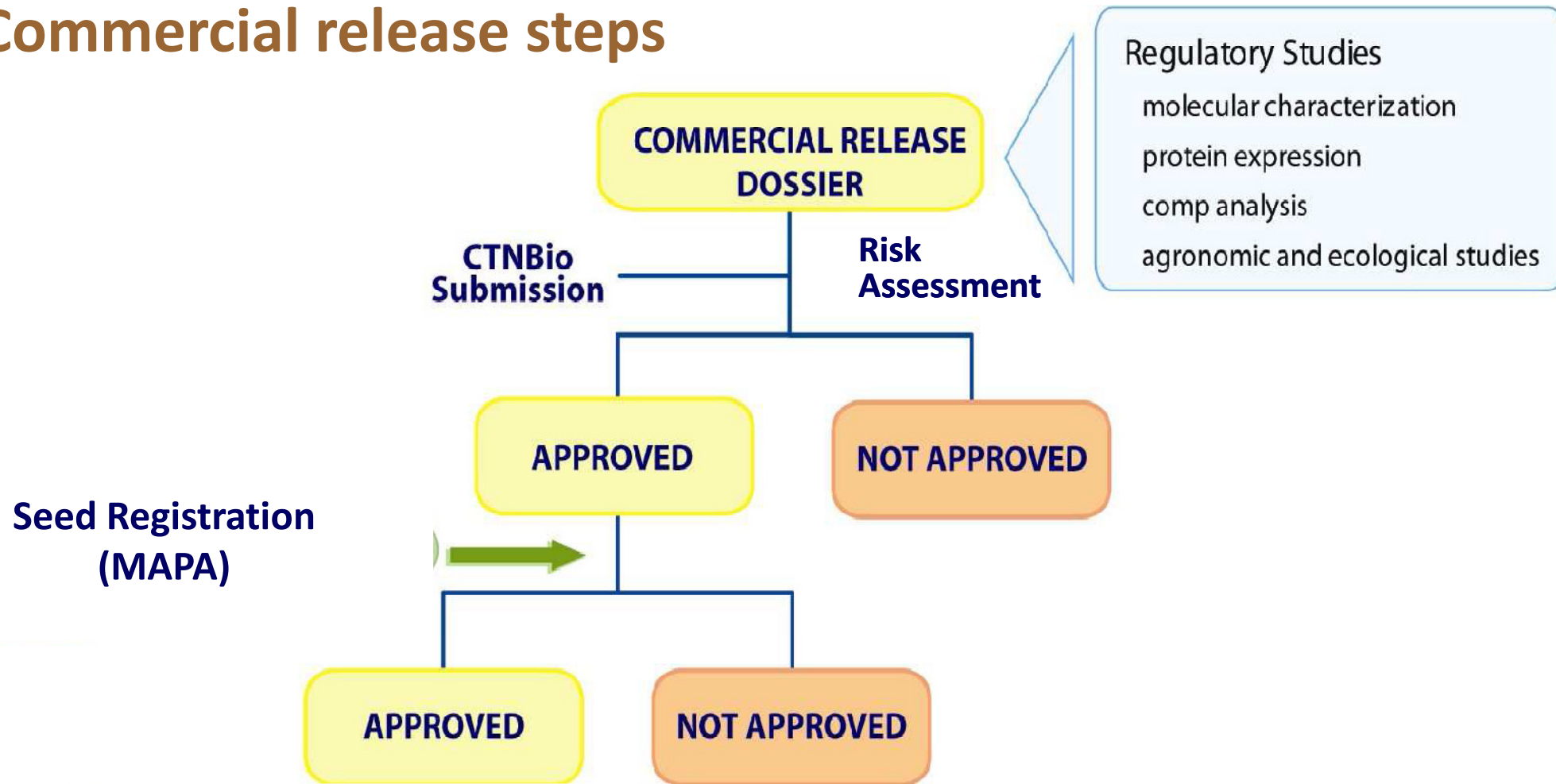
GMO Registration

Commercial release steps



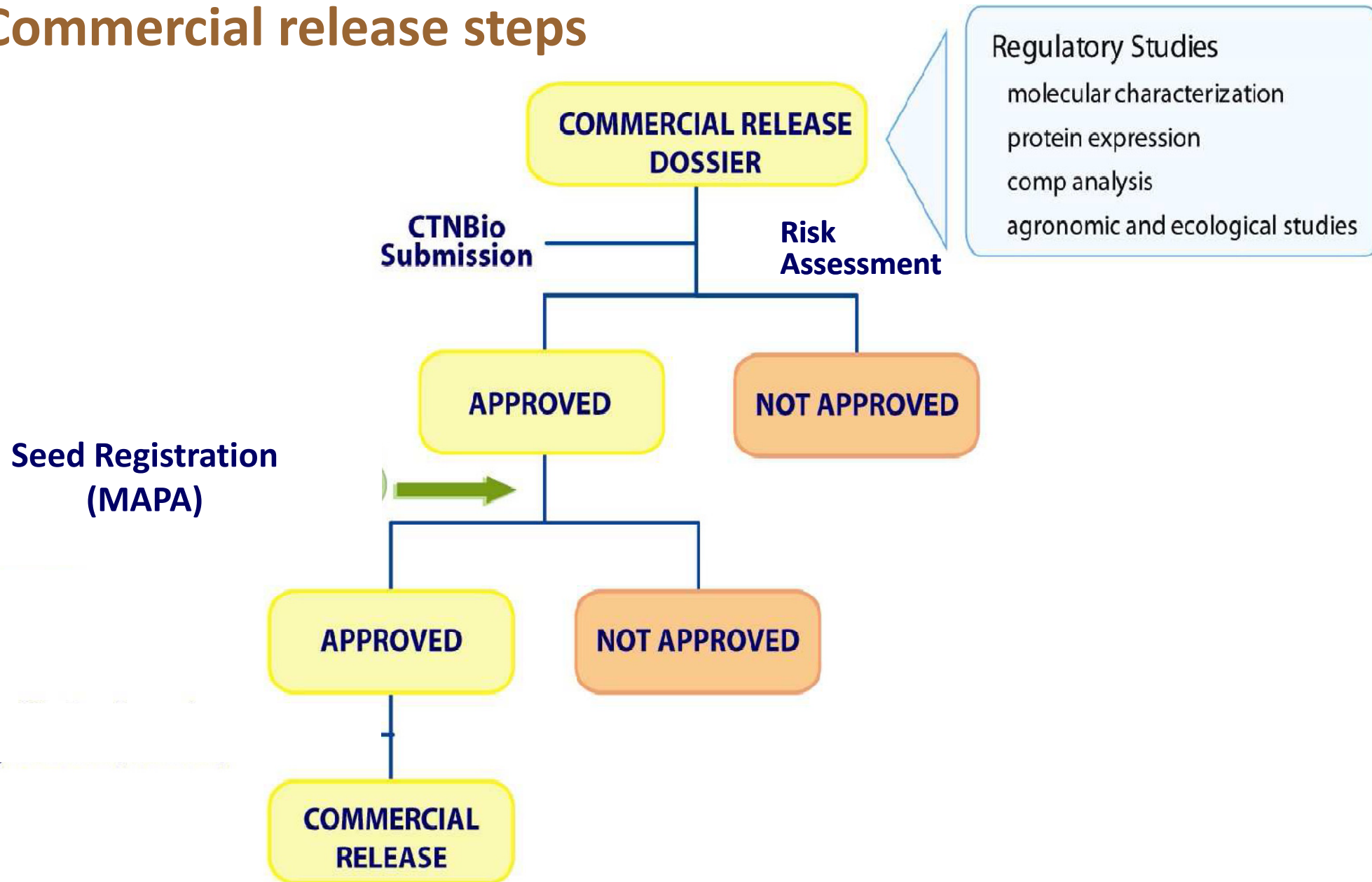
GMO Registration

Commercial release steps

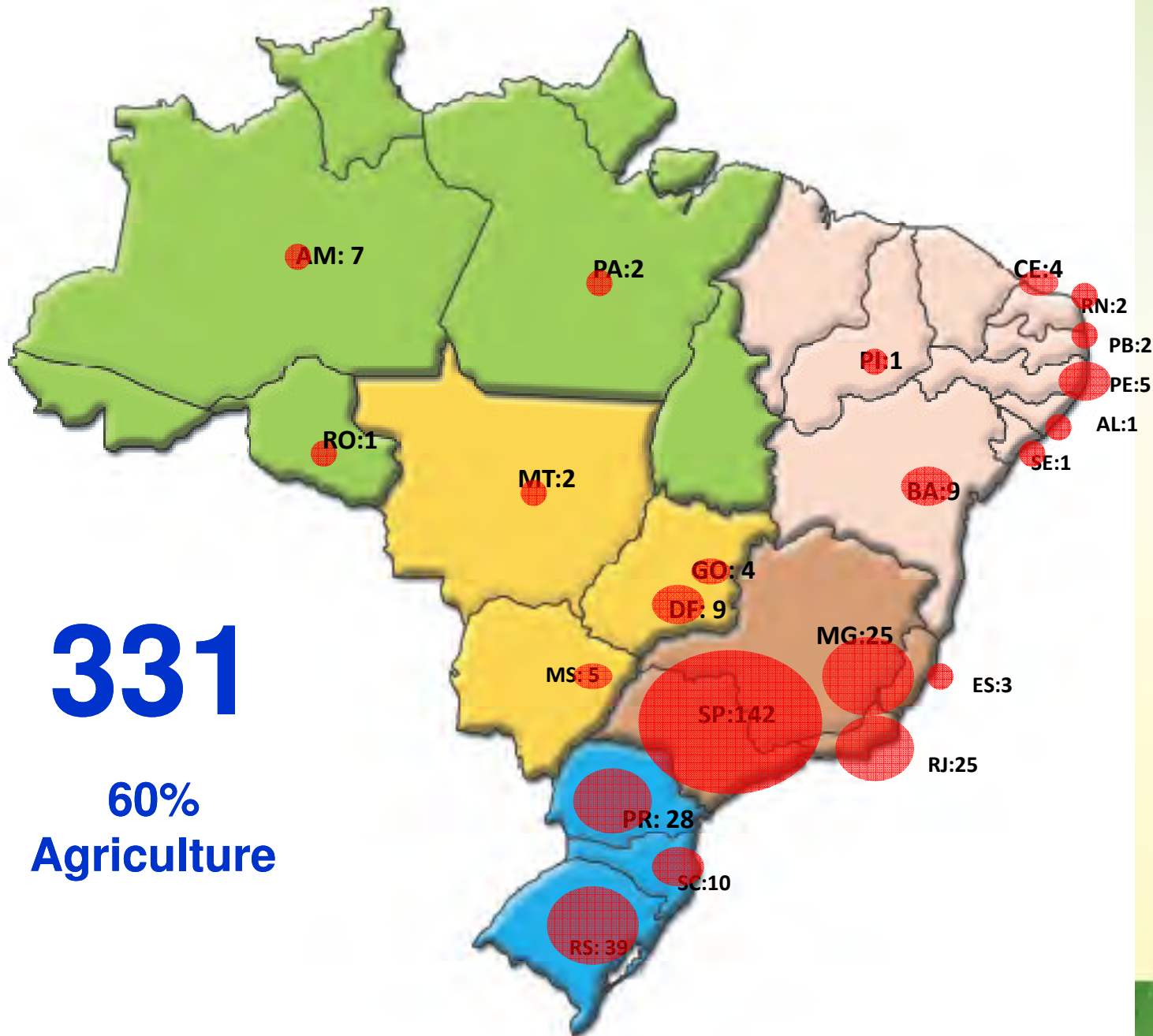


GMO Registration

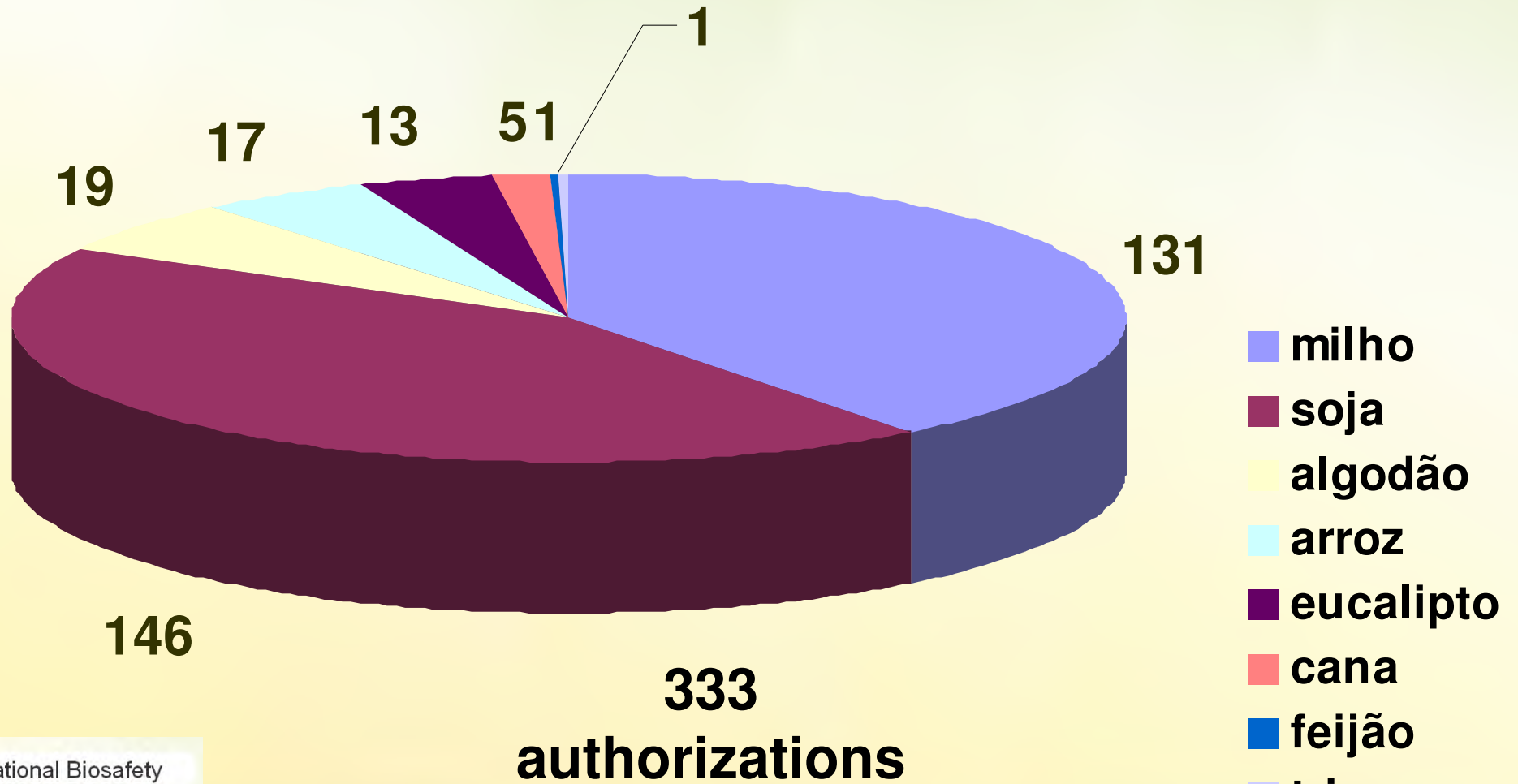
Commercial release steps



Institutions and Companies Authorized to manage GMOs



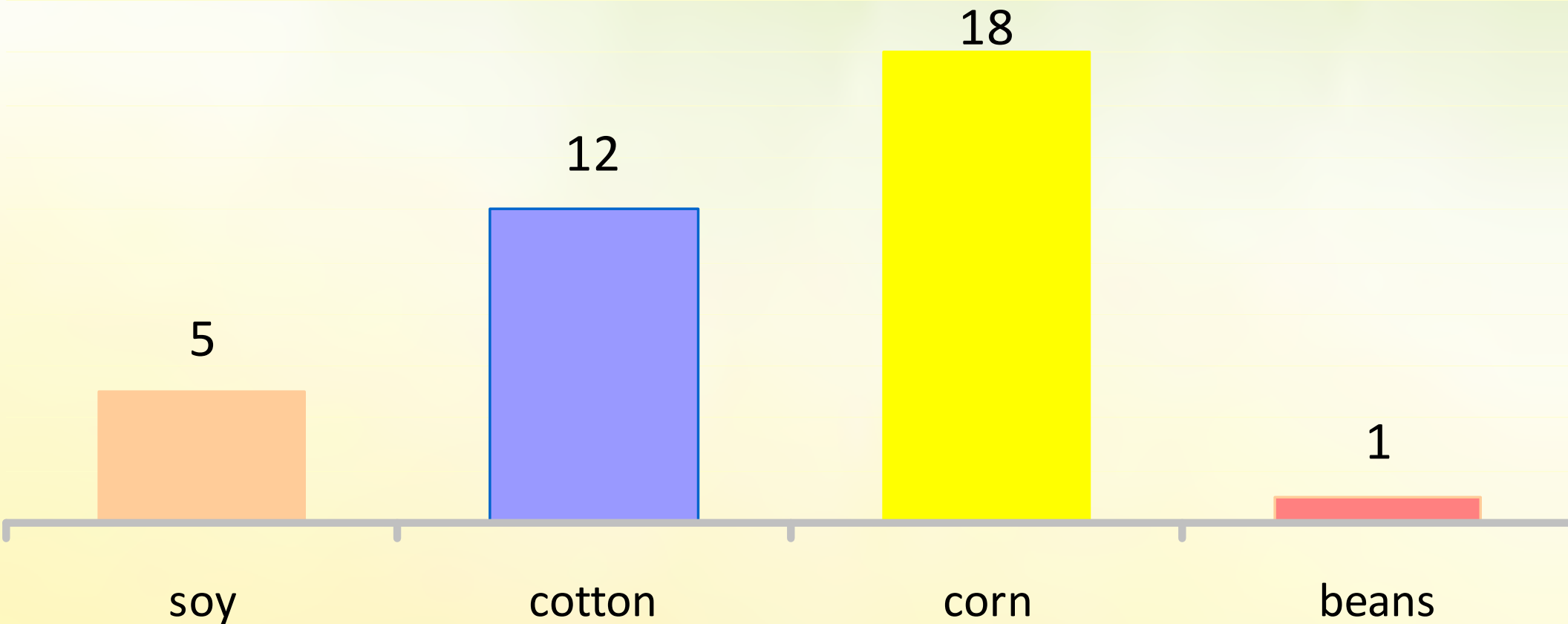
Field Trials Authorizations 2010 – 2011



Distribution of Field Trials



GM Crops Authorized in Brazil per crop (36)





GMO in Brazil (2011)

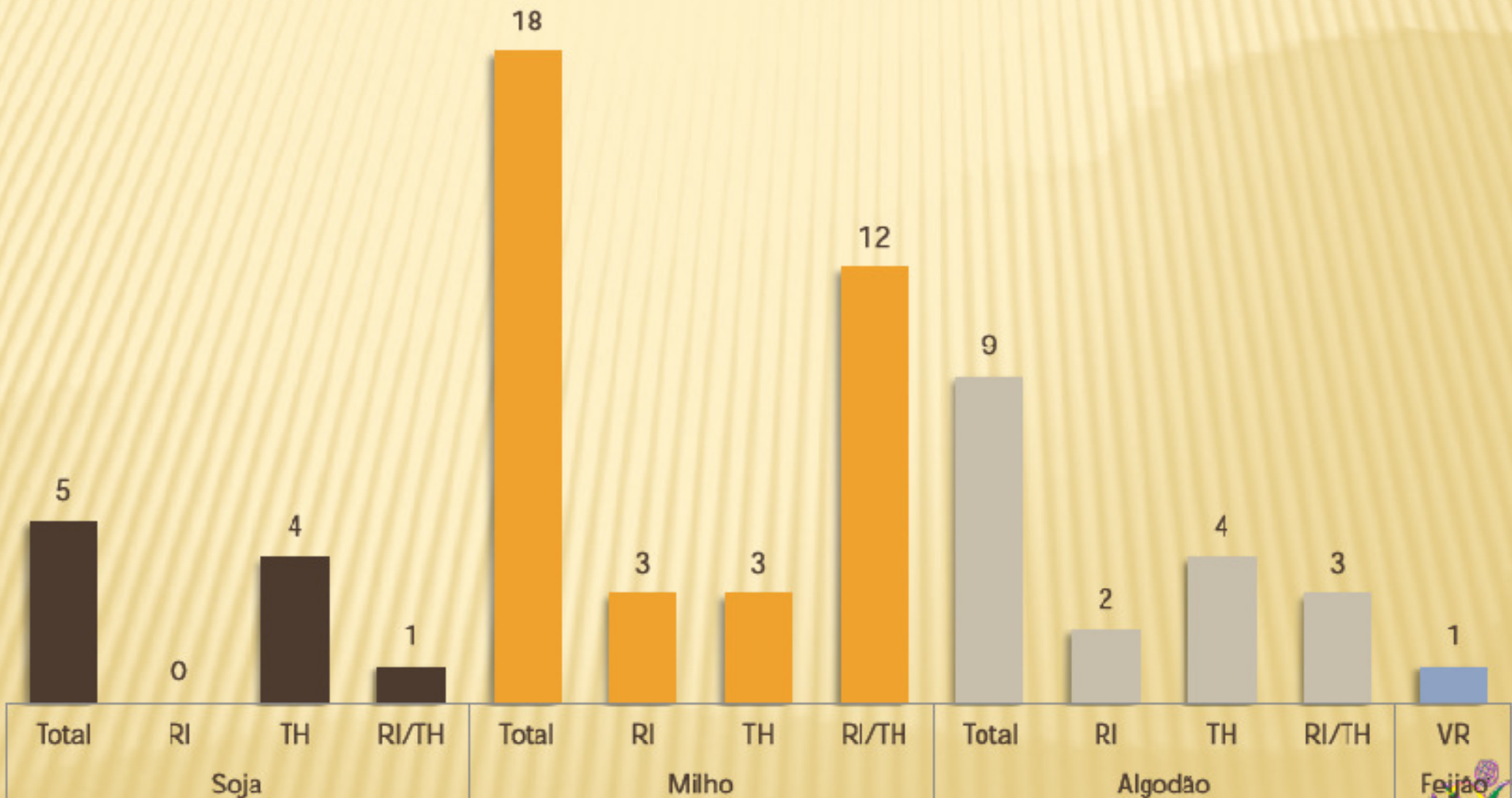
30,3 millions ha:

– SOYBEAN: 20,6 millions ha

– MAIZE: 9,1 millions ha

– COTTON: 0,6 millions ha

Distribution per trait



Source: CTNBIO elaborado por Celeres

2011 - GM Beans



The problem

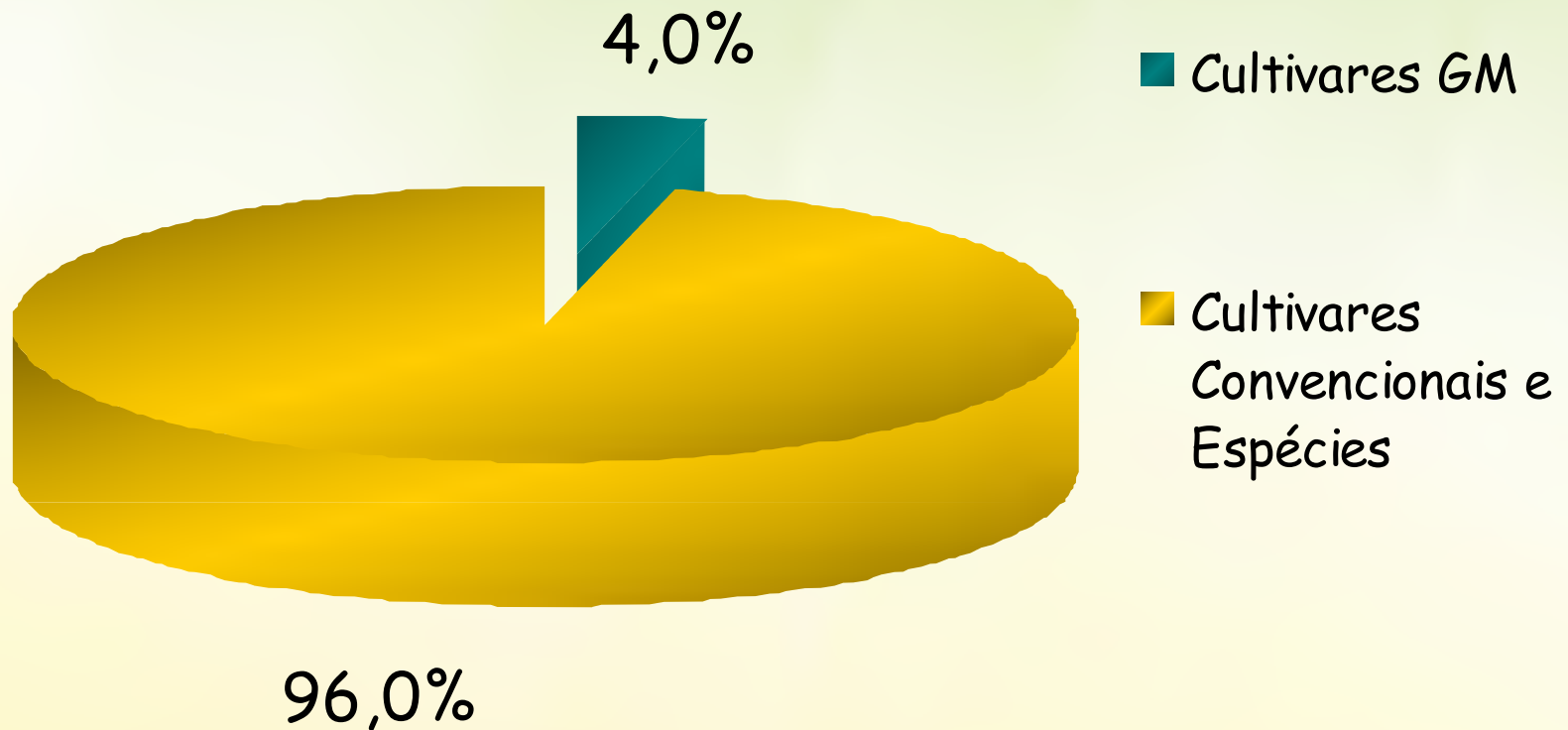
- Mosaic Virus
- 80 – 100 mil tons lost per year
- 200 mil ha with no possibility of cultivation
- 100 – 150 mil tons imported

The alternative: EMBRAPA GM Frijole

- Protection against the Mosaic Virus
- Seeds will be available in 2014
- Technology 100% national



GM Cultivars % in RNC



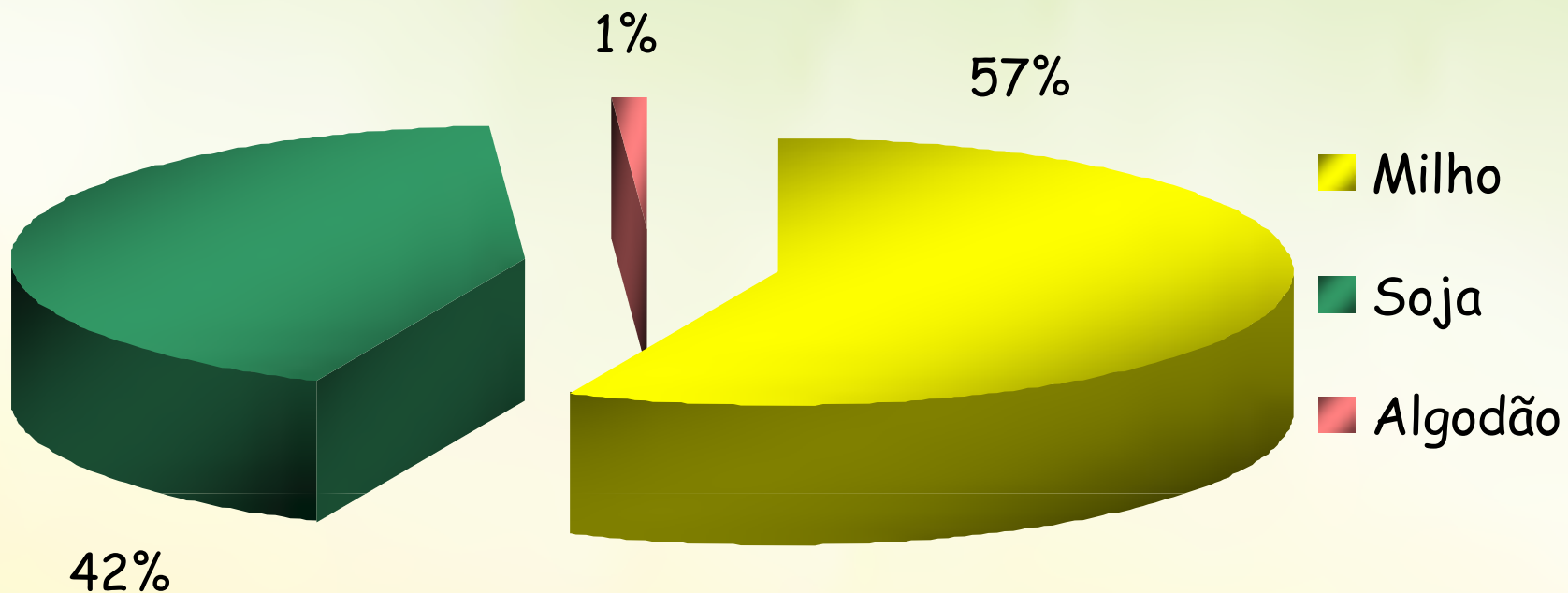
Total de Inscrições: 28.524 *

Cultivares GM: 1.128

Cultivares Convencionais e Espécies: 27.396

*Dados atualizados em 30/07/2012.

GM Cultivars in RNC



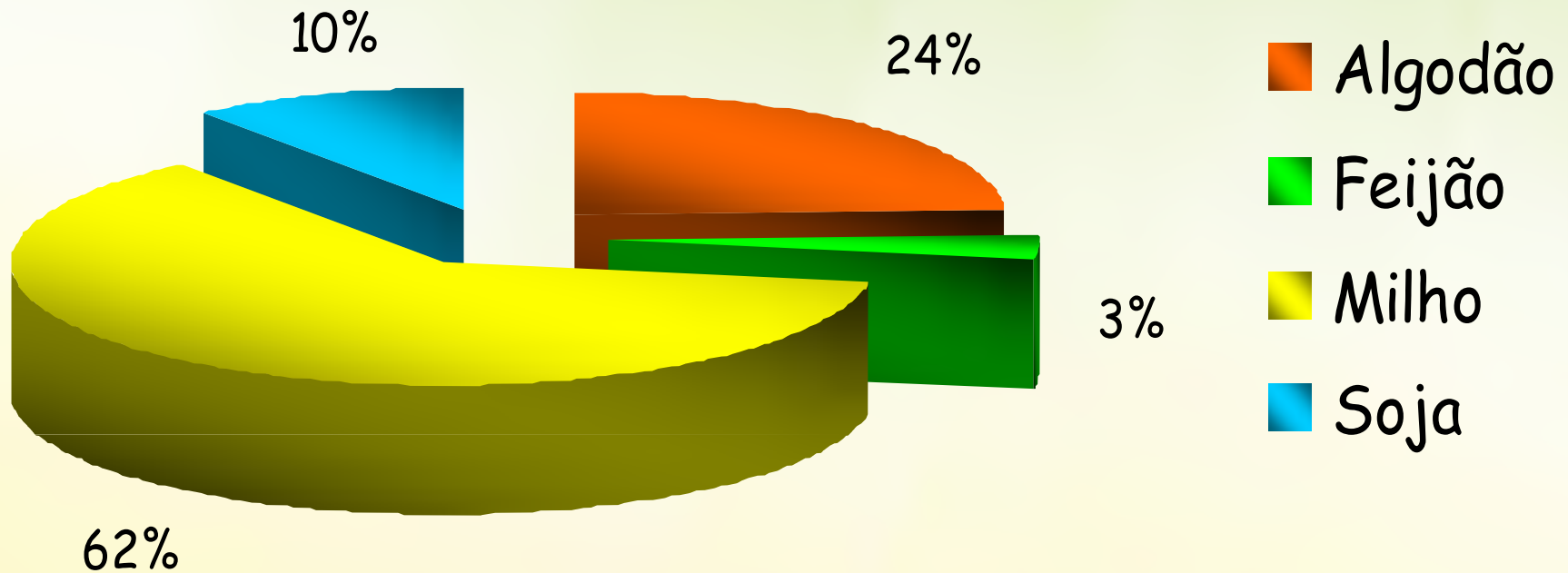
Cultivares GM inscritas no RNC: 1.128*

Algodão: 12

Milho: 640

Soja: 476

Register in RNC



Eventos de Transformação Genética autorizados para inscrição de cultivares no RNC: 29*

:Algodão 07

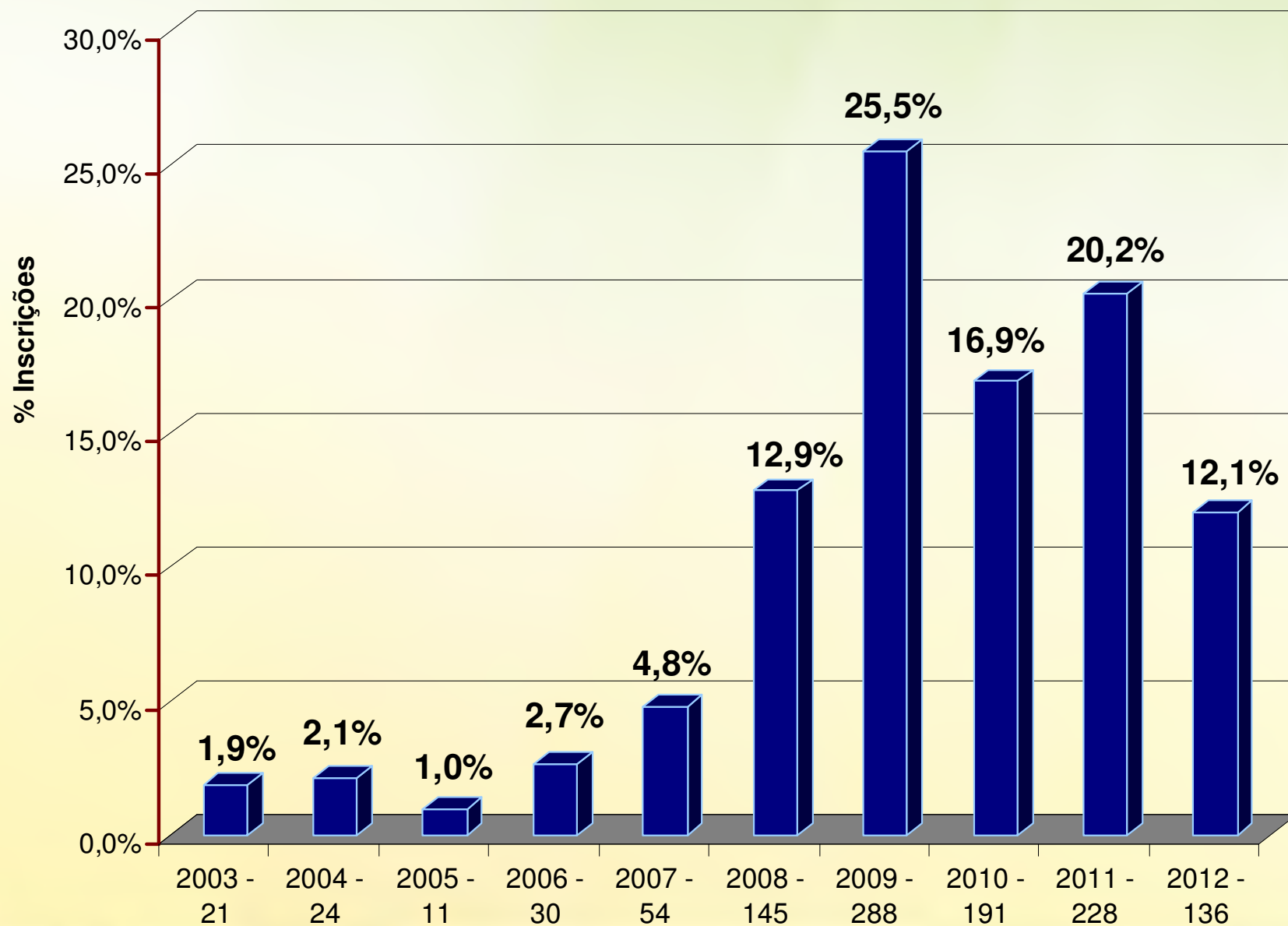
Feijão: 01

Milho: 18

Soja: 03

*Dados atualizados em 30/07/2012.

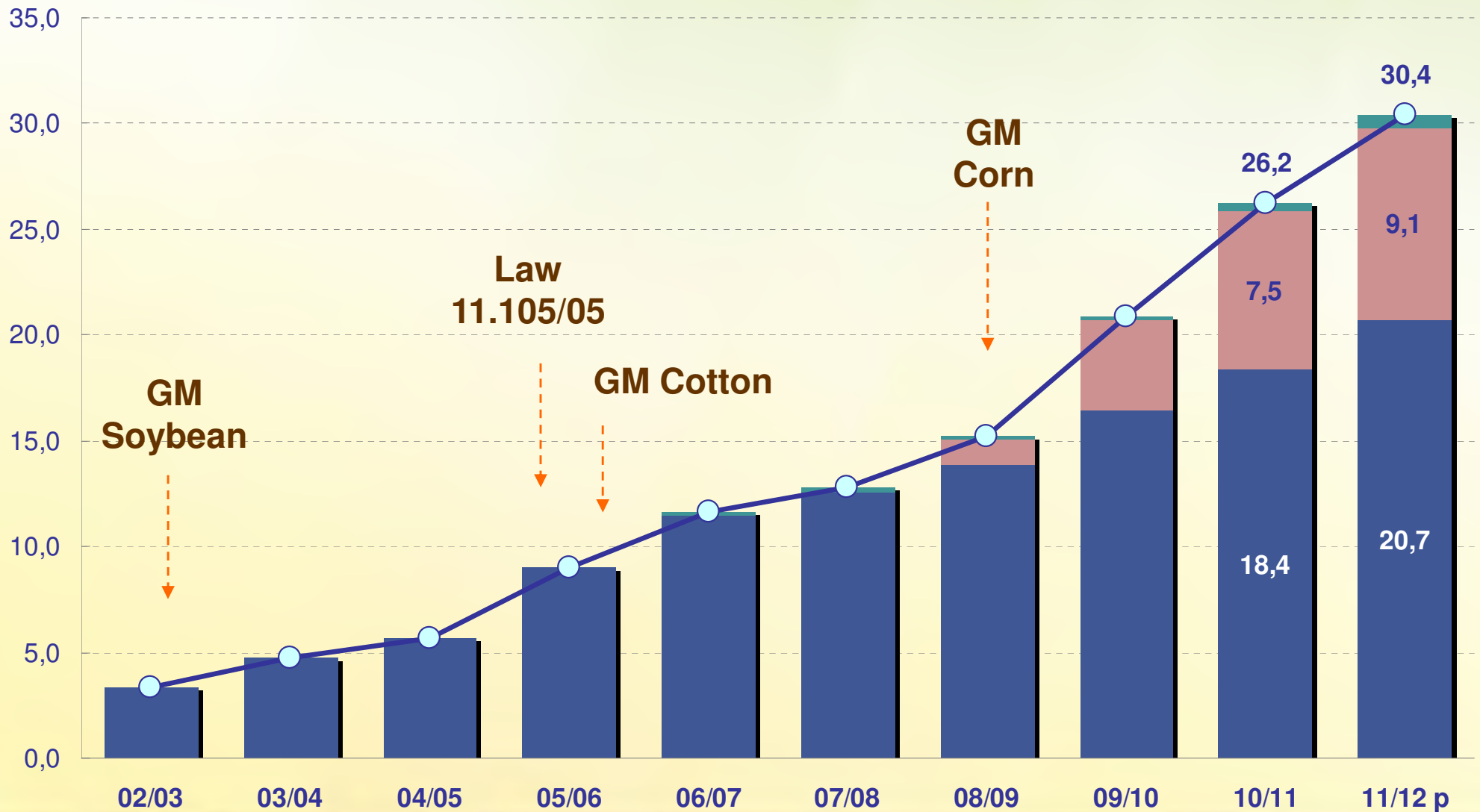
Evolution of GM Cultivars in RNC



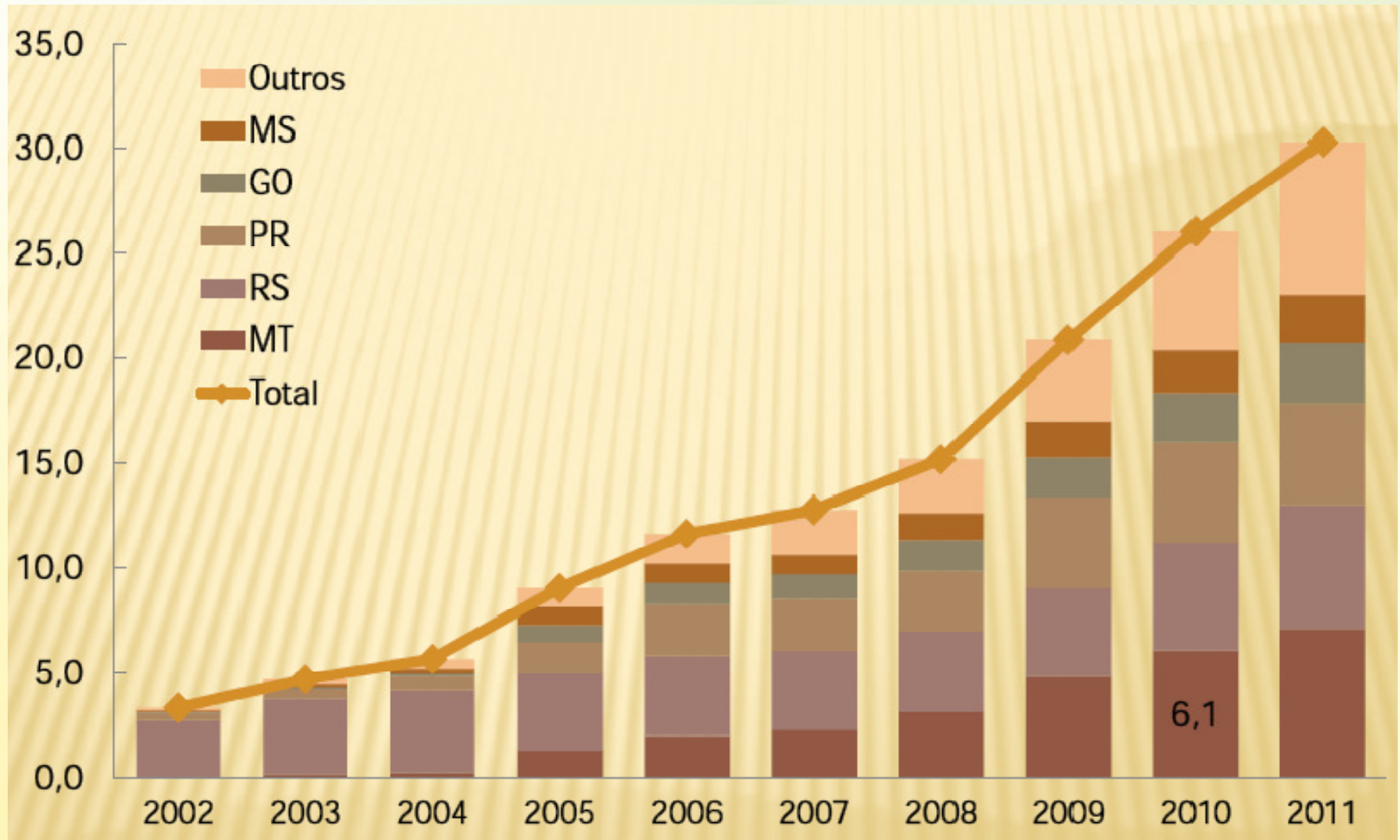
Agricultural Biotechnology Adoption in Brazil

per crop in million hectares

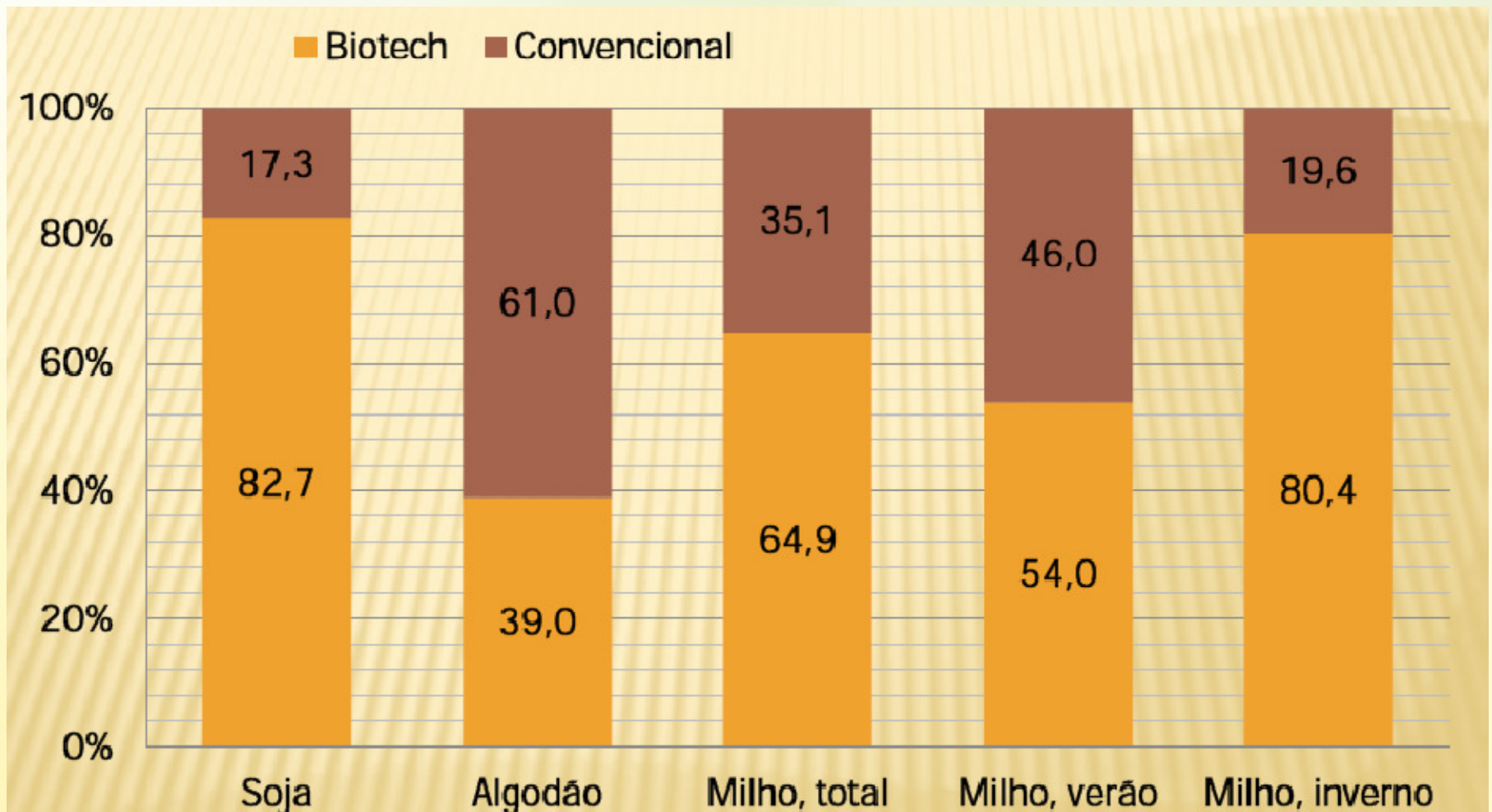
■ Soybean
 ■ Corn
 ■ Cotton
 —○— Total



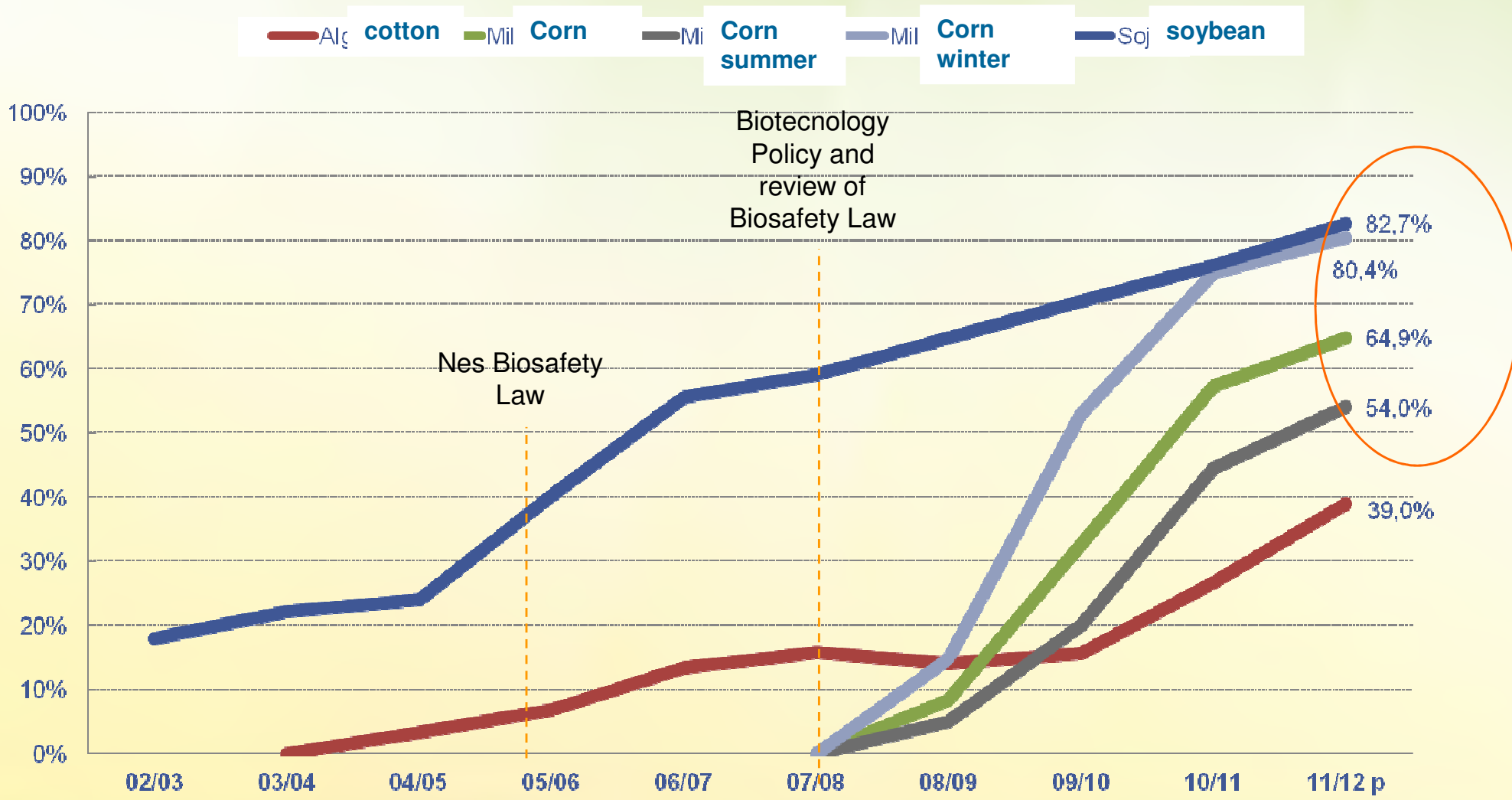
Adoption per states



Adoption Standards 2011



Biotechnology Adoption Rate in Brazil per crop



Soybean Exports Impact

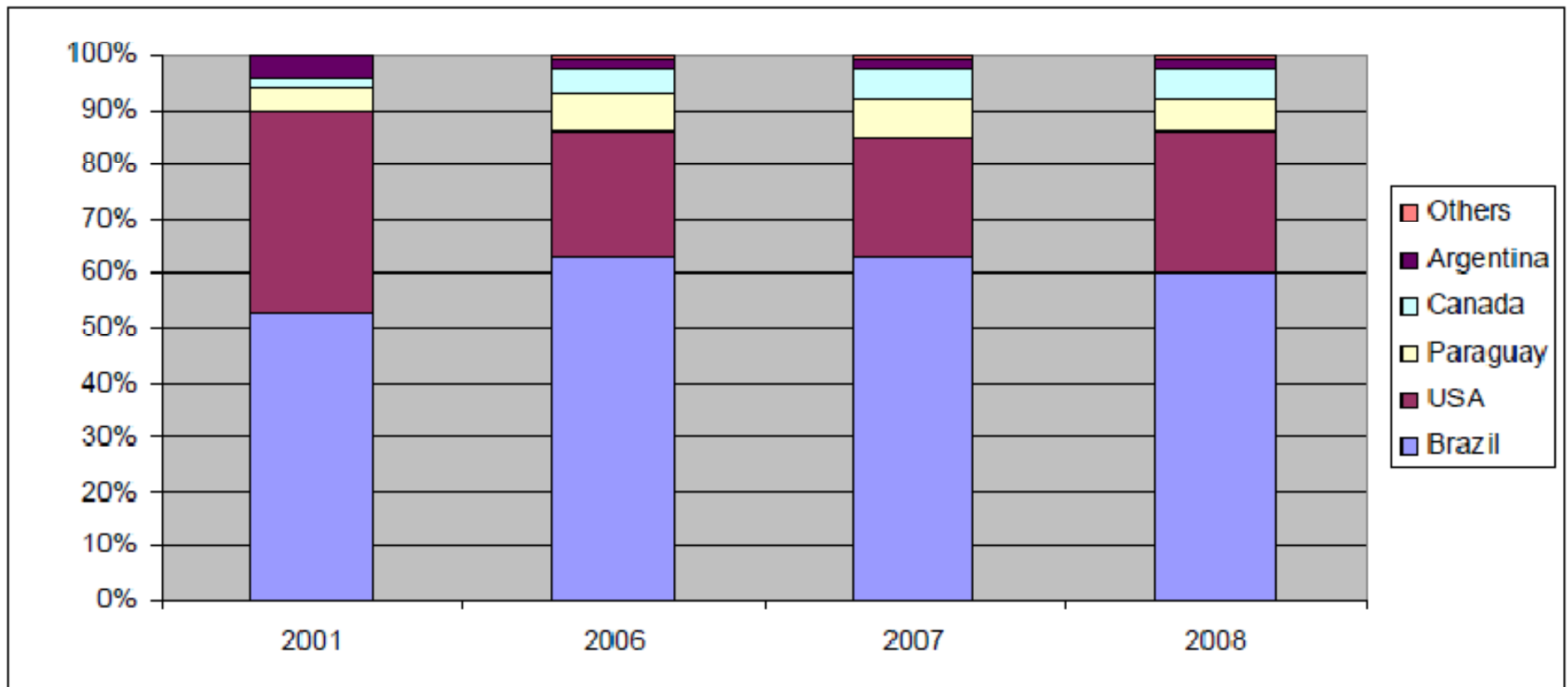


Figure 2.3: Evolution of main soybean supplier shares to EU market, 2001 to 2008, in %

Investments in Research and Human Resources by MAPA

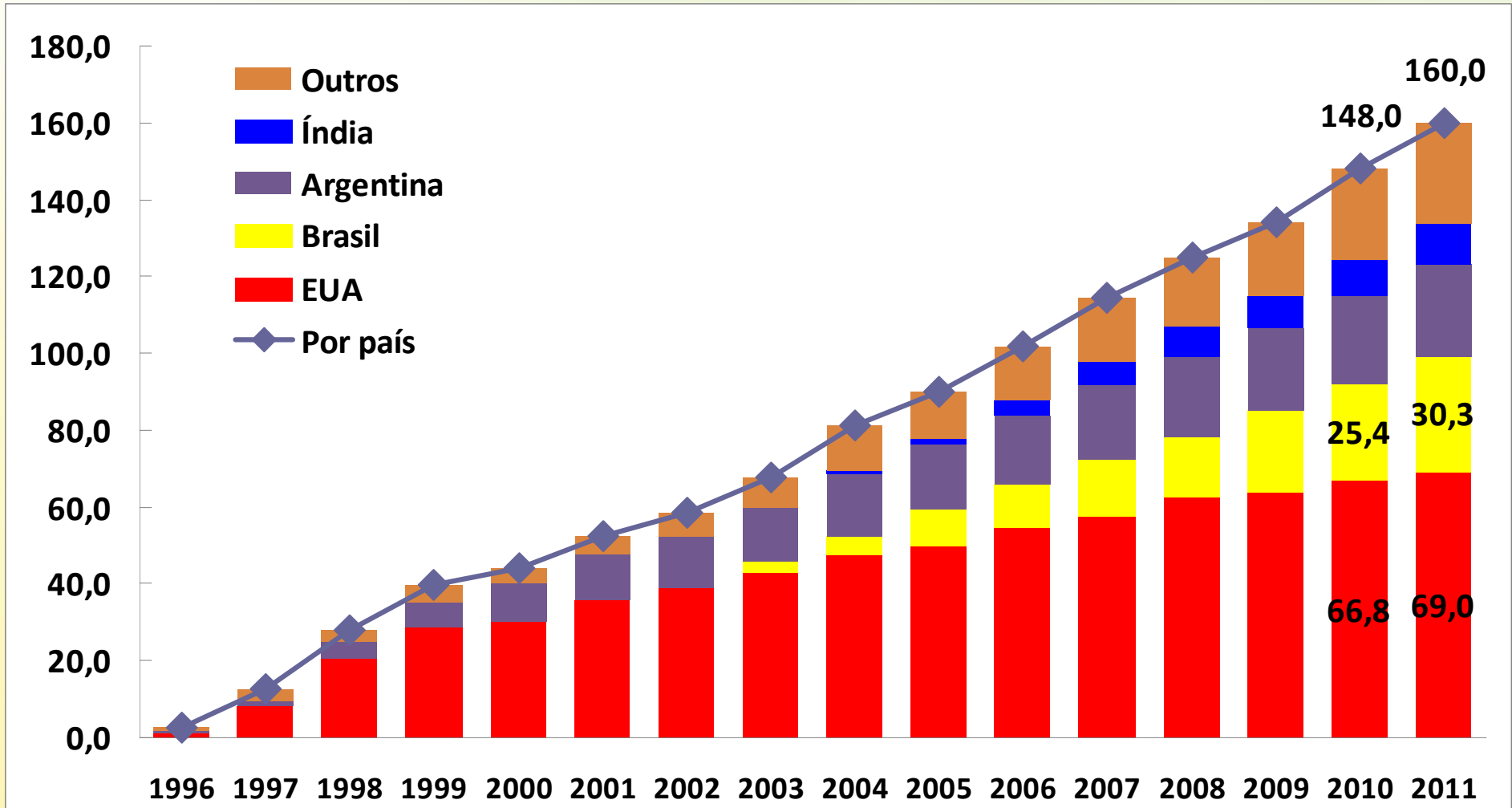
2008 - 2011

- **Risk Assessment:** U\$ 545,000.00 (UFLA – corn; UFSC – eucalipto)
- **GMO detection:** U\$ 489,500.00 (Embrapa, UFSC y UFRS);
- **Capacity Building:** U\$ 168,000.00 (Embrapa y Anbio)

Situação atual (2011)

- **160 milhões de hectares** cultivados com OGM – crescimento de 12 milhões (+8%)
- Cultivados em **29 países**, incluindo 06 países da UE;
- **Brasil: 2º maior produtor** => 30 milhões de ha. (19,3 % a mais que 2010).

Agricultural Biotechnology Adoption per country in million hectares



Fonte: James, Clive 2012

Valores em milhões de hectares

Agricultural Biotechnology Adoption

per country in million hectares

Table 1. Global Area of Biotech Crops in 2011: by Country (Million Hectares)**

Rank	Country	Area (million hectares)	Biotech Crops
1	USA*	69.0	Maize, soybean, cotton, canola, sugarbeet, alfalfa, papaya, squash
2	Brazil*	30.3	Soybean, maize, cotton
3	Argentina*	23.7	Soybean, maize, cotton
4	India*	10.6	Cotton
5	Canada*	10.4	Canola, maize, soybean, sugarbeet
6	China*	3.9	Cotton, papaya, poplar, tomato, sweet pepper
7	Paraguay*	2.8	Soybean
8	Pakistan*	2.6	Cotton
9	South Africa*	2.3	Maize, soybean, cotton
10	Uruguay*	1.3	Soybean, maize
11	Bolivia*	0.9	Soybean
12	Australia*	0.7	Cotton, canola
13	Philippines*	0.6	Maize
14	Myanmar*	0.3	Cotton
15	Burkina Faso*	0.3	Cotton
16	Mexico*	0.2	Cotton, soybean
17	Spain*	0.1	Maize
18	Colombia	<0.1	Cotton
19	Chile	<0.1	Maize, soybean, canola
20	Honduras	<0.1	Maize
21	Portugal	<0.1	Maize
22	Czech Republic	<0.1	Maize
23	Poland	<0.1	Maize
24	Egypt	<0.1	Maize

Biotech Crop Countries and Mega-Countries*, 2011



* 17 biotech mega-countries growing 50,000 hectares, or more, of biotech crops.

Source: Clive James, 2011.